CHAPTER FIVE
NATURAL RESOURCES

This portion of the plan addresses the natural resources in Hartwell. Analysis of natural resources is a critical element in the planning process. Knowledge regarding such resources is important to their protection and conservation. These natural systems provide the means for "... waste disposal, pure water, minerals, food... as well as recreation..." (Wharton, p.8) Awareness of the resources supporting natural systems allows future development to coexist with critical natural systems in a way that ensures the viability of resources in Hartwell in years to come.

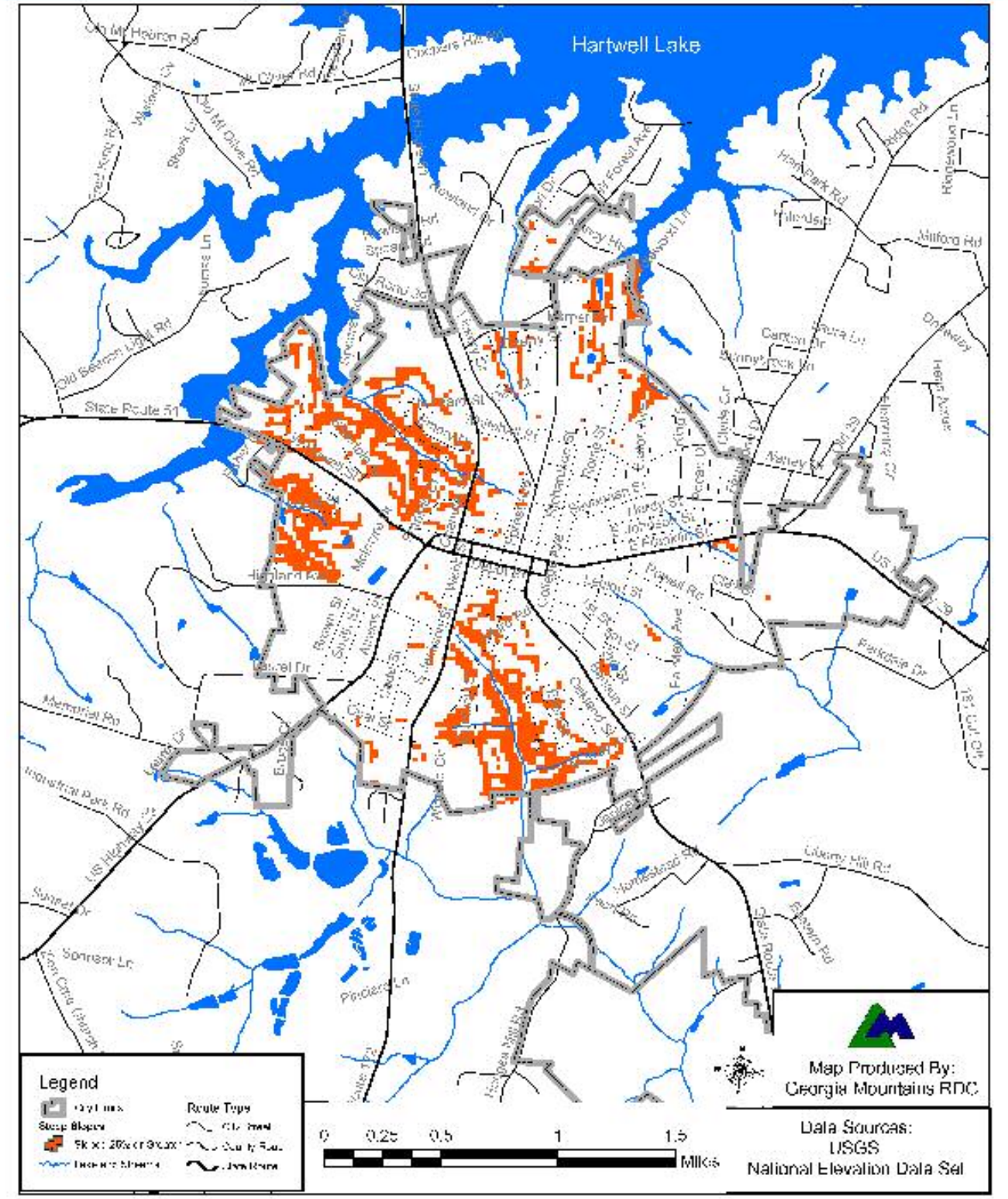
5.1. Physiography, Topography, and Climate.

It is important to consider topography and slope when planning development since these are crucial factors in determining the suitability of land in Hartwell for development. Hartwell is located in the Midland Georgia Subsection of the Southern Piedmont Section of Georgia. The terrain in Hartwell is relatively flat, with elevations ranging from approximately 700 to 800 feet above sea level.

The Department of Natural Resources classifies steep slopes as areas with an average grade of 25 percent or greater. The safety, health, and welfare of the community is jeopardized when areas containing steep slopes become developed. The functioning ability of septic tank drainfields is limited on steep slopes. Septic tank drainfields can occasionally be modified to function on slopes up to 35 percent grade. Beyond 35 percent septic systems often malfunction leading to reduced water quality and possible health risks to area residents. Steep slopes are sensitive to human impacts and are prone to soil erosion when land disturbing activities occur. Eroded sediment decreases habitat area, removes the natural variability in stream systems, and reduces the holding capacity of reservoirs. Slopes pose moderate limitations on development in Hartwell, as seen in Map 5-1.

The piedmont area around the City of Hartwell is composed of weathered gneiss, granite, and schist. Granite is the most significant mineral resource in the area. The Town of Elberton, which is located about 20 miles south of Hartwell, is well known for its granite industry. The granite industry is becoming one of the greatest economic sources in the area. Mined from a vein that is estimated at 35 miles in length and 7 miles wide, the area south of Hartwell now supports 45 granite quarries that produce a total of 174 million dollars worth of sales, and employs 1,800 people.

Map 5-1
Hartwell, Georgia: Steep Slopes



The Southeast Regional Climate Center provides climate data for the Town of Elberton, which is located approximately 20 miles south of Hartwell and experiences a similar climatic regime. The average temperature in Elberton is 59.6, with average summer high temperatures reaching into the high 80's and winter high temperatures in the low 50's. During the summer months, the low temperatures averages in the middle 60's and winter lows in the high 20's to low 30's. The area receives 48.67 inches of precipitation per year and .4 inches of which is snowfall annually.

Soils.

In the comprehensive plan, the purpose of the soil analysis is to identify those soils which indicate where various types of activity should or should not occur. Certain soils have qualities that render them suitable for certain activities or unsuitable for others. The United States Department of Agriculture Soil Conservation Service published a soil survey of Hart County in 1963. Although dated, the soils information is still valid, and remains the only source available for identifying Hartwell's soils. Table 5-1 provides information on the suitability of soils for development, septic use, agriculture, and wildlife. Overall, the Hartwell area has only moderate limitations for development and septic systems.

Table 5-1

Soil Types and Probable Suitability Characteristics for Union County

Soil	% Slope	Development Limitations	Septic Tank Limitations	Woodland Potential	Wildlife Potential	Estimated Acreage in Hart County	Percent Area in Hart County
Alluvial land	0-2	Severe	Severe	Good	Suited	1,887	0.011
Appling Sandy Loam	2-6	Moderate	Moderate	Good	Suited-Marginal	5,787	0.035
Appling Sandy Loam	6-10	Moderate	Moderate	Good	Suited-Marginal	3,684	0.022
Appling Sandy Clay Loam	2-6	Moderate	Moderate	Fair	Marginal-Not Suited	267	0.002
Appling Sandy Clay Loam	6-10	Moderate	Moderate	Fair	Marginal-Not Suited	681	0.004
Alluvial land, wet	0-2	Severe	Severe	Fair	Not Suited	618	0.004
Congree Sandy loam	0-2	Moderate	Moderate	Good	Suited	461	0.003
Cecil Sandy Loam	6-10	Moderate	Moderate	Good	Suited-Marginal	9,735	0.059
Cecil Sandy Loam	10-25	Moderate	Moderate	Good	Marginal-Not Suited	5,800	0.035
Cecil Sandy Clay Loam	2-6	Moderate	Moderate	Fair	Marginal-Not Suited	1,510	0.009
Grover sandy loam	2-6	Moderate	Moderate	Good	Suited-Marginal	1,595	0.010
Grover sandy loam	6-10	Moderate	Moderate	Good	Suited-Marginal	894	0.005
Louisa fine sandy loam	15-25	Moderate	Moderate	Poor	Marginal-Not Suited	1,131	0.007
Madison sandy clay loam	2-6	Moderate	Moderate	Fair	Marginal-Not Suited	1,239	0.008
Madison sandy clay loam	6-10	Moderate	Moderate	Fair	Marginal-Not Suited	8,364	0.051
Madison sandy clay loam	10-15	Moderate	Moderate	Fair	Not Suited-Marginal	9,834	0.060
Madison sandy loam	2-6	Moderate	Moderate	Good	Suited-Marginal	1,220	0.007
Madison sandy loam	6-10	Moderate	Moderate	Good	Suited-Marginal	20,226	0.123
Madison sandy loam	10-15	Moderate	Moderate	Good	Not Suited-Marginal	3,302	0.020

Alluvial Land:

Found on nearly level floodplains, alluvial land is composed of stratified layers of sand, silt, and clay. This series has a high level of variability in its organic-matter content, infiltration rates, permeability, and available moisture capacity. Most areas of alluvial land in Hart County are located in narrow strips with slopes of 0 to 2 percent, near intermittent streams and small branches. Flooding is a concern for agricultural purposes, but alluvial lands are otherwise productive.

Appling Soil:

Appling soils are well drained and derived from weathered granite, gneiss, and some mica schist. Bedrock is generally found between 4 to 15 feet. Appling soils are acidic, but respond well to fertilizer and lime. Most of areas of appling soils have been cleared for agriculture, pasture land, or development.

Cecil Soil:

Similar to appling soils, cecil is formed from granite, gneiss, and mica schist. This soil is acidic and well drained. Slope varies from 2 to 25 percent. About 3/4 of Hart County's land that is classified in the cecil series is used for agricultural production or pasture.

Congree Soil:

The Congree series is composed of mixed alluvium that has been deposited on first bottoms, and range in slope from 0 to 2 percent. Most of the land area of this soil type is occupied by crop (corn, grain, and sorghum) and pasture land. Flooding can reduce yields.

Grover Soil:

Grover soils are found on uplands and are well drained. This soil series is acidic but respond to fertilizer and other amendments. The parent material for Grover soils include quartz mica schist and micaceous gneiss, and are found on broad, gently sloping ridges. Most of this soil's land cover has been cleared and is used for cropping of cotton, corn, and small grain.

Louisa Soil:

Louisa soils are excessively drained and acidic, and occur on uplands. Derived from mica schist, mica gneiss, and quartz mica schist, these soils are found on moderate slopes of 6 to 25 percent. Lousia soils are scattered throughout

Hart County, and are dominantly covered by woodlands. Not especially suited to agriculture, this soil does not respond well to fertilizer, is prone to dry out, and is easily leached of plant nutrients.

Madison Soil:

Similar to Louisa soils, the Madison series is found on uplands with slopes ranging from 2 to 25 percent. Most of the acreage is forested with pines and hardwoods and areas with gentle slopes are said to be some of the best soils for cultivation in the County.

5.3. Prime Agricultural and Forest Lands.

Due to the urbanized nature of Hartwell, and the general lack of active agricultural uses, protection of prime agricultural lands, and forested lands are not necessary. Nonetheless, agriculture and forestry plays an important role for the City of Hartwell, and merits further consideration. The *Forest Statistics for North Central Georgia, 1998*, developed by the U.S. Department of Agriculture, identifies 65,900 acres of total forest, of which 65,800 acres is listed as timberland, and 2,700 acres is managed by the private forestry sector. The U.S. Department of Agriculture's *2002 Census of Agriculture* lists 567 farms in Hart County. These farms cover a total land area of 65,352 acres, with the median farm size of 78 acres. Total cropland in Hart County is 33,397 acres, of which harvested cropland totals 16,439 acres. The market value of agricultural products sold is $82,471,000, excluding a value of $80,454,000 for livestock and poultry rearing.

5.4. Wetlands.

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. The ecological parameters for designating wetlands include hydric soils, hydrophytic vegetation, and hydrological conditions that involve a temporary or permanent source of water to cause soil saturation.

Fresh water wetlands and aquatic habitats are classified into the following categories:

Open Water - Areas of open water, primarily reservoirs, ponds, lakes, rivers, and estuaries.

Non-Forested Emergent Wetlands - freshwater marshes dominated by a variety of grasses, sedges, rushes, and broad leaved aquatics associated with streams, ponded areas, and tidally-influenced non-saline waters.

Scrub/Shrub Wetlands - non-forested areas dominated by woody shrubs, seedlings, and saplings averaging less than 20 feet in height; these wetlands may integrate with forested wetlands, non-forested emergent wetlands, and open water.

Forested Wetlands - natural or planted forested areas having a dominant tree crown closure or hardwoods, pines, gums, cypress, or any combination of these types. These areas are usually in stream or river floodplains, isolated depressions, and drainways, and contain standing or flowing water for a portion of the year.

Subcategories:
- Hardwood floodplain forests
- Coniferous floodplain forests
- Mixed floodplain forests
- Non-alluvial forested wetlands

Altered Wetlands - areas with hydric soils that have been denuded of natural vegetation and put to other uses, such as pastures, row crops, etc., but that otherwise retain certain wetland functions and values.

Table 5-2 indicates important values that wetlands provide, while Table 5-3 provides typical vegetation found in different types of wetlands.

TABLE 5-2
MAJOR WETLAND VALUES

SOCIOECONOMIC VALUES	ENVIRONMENTAL QUALITY VALUES
Flood Control Wave Damage Protection Erosion Control Groundwater Recharge & Water Supply Timber & Other Natural Resources Energy Source (peak) Livestock Grazing Fishing & Shellfishing Hunting & Trapping Recreation Aesthetics Education & Scientific Research	Water Quality Maintenance Pollution Filter Sediment Removal Oxygen Production Nutrient Recycling Chemical & Nutrient Absorption Aquatic Productivity Microclimate Regulator World Climate (Ozone layer)
	FISH AND WILDLIFE VALUES
	Fish & Shellfish Habitat Waterfowl & Other Bird Habitat Forbearer & Other Wildlife Habitats

Source: American Planning Association, Planning Advisory Service. 1988. *Protection of Non-Tidal Wetlands. (Report Number 412/413).*

TABLE 5-3
VEGETATION COMMON TO NON-TIDAL WETLANDS

TYPE OF WETLAND	VEGETATION
Emergent Wetlands: Freshwater	Cattails, wild rice, sedges, rushes, bulrushes, spikerushes, burreeds, rice cutgrass, maidencane, reed, arrowheads, pickerelweed, smartweeds, bluejoint, whitetop, reed cannary grass, manna grass, asters, goldenrods, marsh fern
Pocosins	Pond pine, sweet bay, inkberry, fetterbush, titi, red bay, was myrtle
Others	Buttenbush, alders, willows, dogwoods, red maple sapplings, cottenwood sapplings

Source: American Planning Association, Planning Advisory Services. 1988. *Protection of Non-Tidal Wetlands. (Report Number 412/413).*

The U.S. Fish and Wildlife Service has completed the National Wetlands Inventory for the Hartwell area. The mapping indicates that there are no significant wetland areas in the City of Hartwell, although areas classified as wetlands do exist to the west, south, and southeast of the City (See Map 5-2).

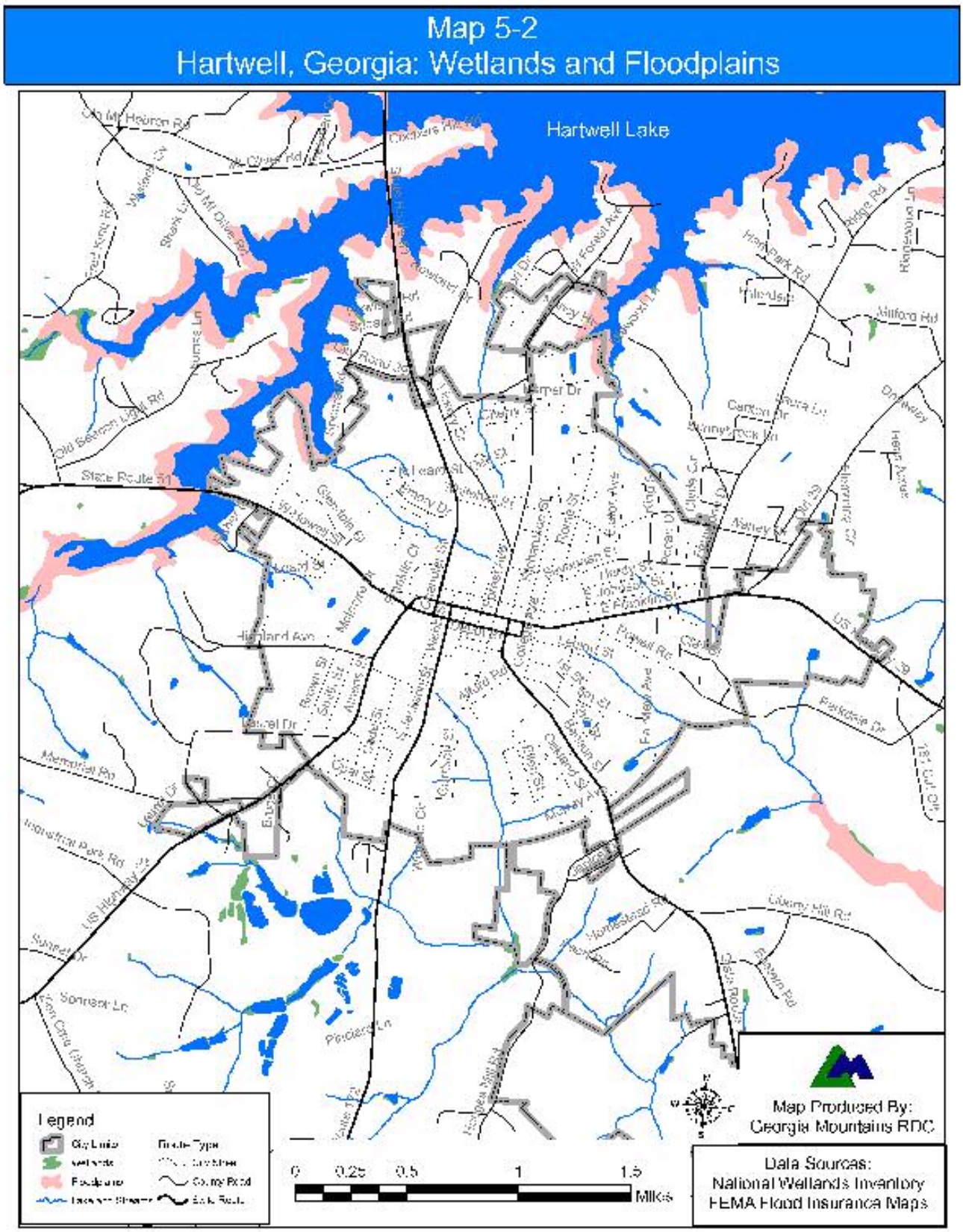
A federal permitting process that includes a public interest review controls activities in wetlands. Land disturbing activities located in wetlands requires a Section 404 (of the Clean Water Act) permit, which is obtained from the U.S. Army Corps of Engineers. Section 404 provides for a permitting process for the discharge of dredge or fill material that may have a negative influence on municipal water supplies, shellfish beds, fishery areas, wildlife, or recreational areas, and aim to avoid the alteration or degradation of wetlands. The Department of Natural Resources (DNR) has established minimum planning criteria for the protection of wetlands. These criteria call for the identification of wetlands, which is completed with the description and map provided in this document, and the consideration of wetlands in land-use plans (See Map 5-2). If wetlands are identified in the future land use plans are retained as open

space, then no adverse effects are anticipated on the public health, safety and welfare, or the property of others; no known unique or significant flora or fauna will be impacted; no adverse effects will occur on the flow or quality of water or cause substantial additional soil erosion; no adverse effects are expected to occur that would effect fishing or the recreational use of wetlands; no significant impact is anticipated on significant historical or archaeological resources; and since the plan discourages the alteration of identified wetlands, no adverse impacts on adjacent natural areas are likely to occur. The plan also supports the preservation of any wetlands created for mitigation purposes under Section 404 of the Clean Water Act.

5.5. Floodplains.

Both Hart County and the City of Hartwell currently participate in the Federal Emergency Management Agency's (FEMA) National Flood Insurance Program (NFIP). The NFIP is a Federal program that allows property owners to purchase nationally backed flood insurance. Participating local and county governments cooperate with the Federal Government to adopt and enforce floodplain management ordinances to reduce the future risks associated with flood hazards. FEMA's floodplain data, which is based on 100-year flood reoccurrence intervals, identifies small portions of the northern, residential, section of Hartwell as being potentially impacted by flood hazards. This area is classified as a floodplain due to the potential of rising water levels from Lake Hartwell following extreme large-scale precipitation events. Despite the occurrence of a number of perennial and intermittent streams in the City of Hartwell, there are no significant floodplains associated with these features. Future annexation of areas north of the current city limits (along the shores of Lake Hartwell) will result in larger areas of floodplain overlap within the City Limits (See Map 5-2).

Map 5-2
Hartwell, Georgia: Wetlands and Floodplains



5.6. Protected River Corridors.

The State of Georgia classifies rivers with an average annual flow of at least 400 cubic feet per second as subject to provisions for river corridor protection. The State of Georgia has developed minimum standards for the protection of these streams. According to the Department of Community Affairs (DCA), the entire Savannah River is classified under DNR's Protected River Criteria. Measures recommended under the Criteria include the establishment of a 100 ft buffer measured horizontally from the riverbank. Within this area, a River Corridor Protection Plan is established which provides for the maintenance of a natural vegetation buffer and considers the effects of activities in the river corridor on public health, safety, welfare, and the private property rights. Consideration of unique characteristics significant in the river corridor, consideration of the effect of any activities within the river corridor on the function of the protected river and corridor, and the preservation of any significant state historical and archaeological resources is required under the River Corridor Protection Plan. Further, the River Corridor Protection Plan shall:

- Residential developments are to be located on tracts of land containing at least two acres.
- Septic tank drainfields shall not be located within the buffer area.
- Forestry activity shall be consistent with best management practices established by the Georgia Forestry Commission.
-Agricultural activity shall be consistent with all state and federal laws, and all regulations promulgated by the Georgia Department of Agriculture.
-Handling areas for the receiving and storage of hazardous waste are prohibited within river corriors.
-Hazardous waste or solid waste landfills are prohibited within river corridors.

Due to the proximity of the Savannah River to Hartwell, the establishment and maintenance of the DNR's River Corridor Protection Criteria should be noted and supported.

5.7. Water Supply Watersheds.

Concern regarding the quality of public water supplies prompted the state to develop land management measures to protect public drinking water sources. The City of Hartwell utilizes water from an intake on Lake Hartwell, which withdraws an average of 3.5 million gallons per day (mgd), with a daily maximum water withdrawal of 4.5 mgd. Public water supply intakes on Lake Hartwell are exempt from the standards setforth by the DNR because Hartwell Reservoir is owned/operated by the U.S. Corps of Engineers who maintains its own standards. The City of Hartwell is not located in a water supply watershed requiring protective actions, however, because of the close proximity of the City to the public water intake along GA route 53, the adoption of the Georgia Environmental Planning Criteria for a Large

Water Supply Watersheds (a watershed with an area of 100 square miles or more) should be considered to help maintain the quality of drinking water supplies for the safety and welfare of the public. Within 7 miles of a publicly owned water intake, the Environmental Planning Criteria for Water Supply Watersheds calls for the creation of 100 foot stream buffer of perennial tributaries of a water supply reservoir, restriction of impervious surfaces within 150 feet of the stream banks, the prohibition of septic tanks and drainfields within 150 feet of the stream bank, and hazardous materials handlers are required to maintain operations on impermeable surfaces with spill and leak collection systems. As stated earlier, these are the conditions established by the DNR for a large watershed water supply watershed. The City of Hartwell is not mandated to conform to these standards, however adopting these regulations (or more stringent) may be in the best interests of the community.

5.8 Public Water Supply Sources

The municipal water supply for the City of Hartwell is taken from a surface water intake located near the confluence of Light Wood Log Creek and Lake Hartwell. The City water treatment plant is estimated to annually treat 1.75 million gallons per day (mgd), an average annual maximum of 3.5 mgd, and a daily maximum of 4.5 mgd. This water is distributed through 98 miles of water line. The water lines vary in size between 2 and 12 inches. Hartwell's water system supplies approximately 2,100 residents, and 400 non-residents. Because the Corps of Engineers operates Lake Hartwell, the City of Hartwell's water intake is not subject to Water Supply Watershed Criteria as dictated by the Georgia Department of Natural Resources (DNR). Areas within Hartwell not served by public water uses private groundwater wells. In the Hartwell area, wells that reach depths of 100 to 250 feet commonly produce yields of 6 to 10 gallons per minute, and are adequate for small-scale private users.

5.9 Waste Water Facilities

Hartwell's wastewater is managed by the Hartwell Wastewater Treatment Plant, and serves 1,900 residents (nearly half of the city population). This facility was constructed in 1965, but has been updated on numerous occasions with the most recent modification being made in 1998. Hartwell's sewer system is composed of 60 miles of gravity sewer lines that very in diameter from 8 to 18 inches. Eleven publicly owned sewage pumping stations and six privately owned pumping stations are currently in use. The City of Hartwell Wastewater Treatment Plant currently produces an average of 1.0 mgd, which is managed through a Land Application System (LAS), which allows treated waste to be used

as a soil conditioner and fertilizer. Currently, the Cateechee Golf Course is the recipient of irrigation water produced from the water treatment plant. The effectiveness of the sewer system is enhanced with a sewer use ordinance, which was adopted in 1983.

Residents that do not have access to Hartwell's sewer system utilize septic systems. As described in the soils section, Alluvial Land and Alluvial Land Wet are the only major soil types with sever limitations in regards to septic use. Some other potential factors that may pose problems include the limited depth to bedrock throuthout the county which reduces the effectiveness of the septic filtration. The proximity of septic systems into Lake Hartwell is also a concern due to potential discharges from septic systems into lake waters. Contamination of Hartwell Reservoir from septic system malfunctions produces negative environmental impacts and limits its use as a recreational area and water supply source.

5.10. Groundwater Recharge Areas.

The minimum planning standards require that local governments address protection of significant groundwater recharge areas. A recharge area is any portion of the earth's surface where water infiltrates into the ground to replenish an aquifer. Although there are nine significant groundwater recharge locations in Hart County, Hydrologic Atlas 18, developed by the Georgia Department of Natural Resources, does not identify any significant groundwater recharge areas in or within the immediate vicinity of the City of Hartwell. Hydrologic Atlas 20 also lists the City of Hartwell as lower susceptibility to groundwater contamination.

5.11. Plant and Animal Habitats.

Through the Natural Heritage Program, the Georgia Department of Natural Resources (DNR) has identified protected, candidate, or partial status plants and animals in Hart County. Only the Bald Eagle (Haliaeetus leucocephalus) and Sandbar Shiner (Notropis scepticus) have identified as protected animals near the City of Hartwell. The Pale Yellow Trillium (Trillium discolor) is the only protected plant species in Hart County, and there are not any special natural communities in the County. While these species may be found in the County, special provisions for protected plants and animals is not necessary for the City of Hartwell.

5.12. Major Park, Recreation, Conservation Areas, and Scenic Views and Sites.

No major recreation or conservation areas are found in the City of Hartwell, but Lake Hartwell is located

just to the north and east of the city limits. This 55,000 acre lake provides a multitude of space for water-based recreational activities including boating, swimming, and fishing. The lake attracts 11 million visitors annually, and is one of the thee most visited lakes under the management of the Army Corps of Engineers. The Hartwell Lake area offers more than 80 public park sites, complete with camping, picnicking, and boat launch facilities. Ten public access points to the lake are located in Hart County, as well as several campgrounds. The Hartwell Lake Museum is located at the Hartwell Dam, seven miles east of Hartwell off of U.S. 29.

The U.S. Army Corps of Engineers manages Hartwell Lake's 962 miles of shoreline, as well as the 250 bird species, 40 mammal species, and numerous aquatic, reptilian, and amphibian species that call the surrounding area home. Popular fish species found in Lake Hartwell include: Crappie, Largemouth Bass, Hybrid Bass, and Walleye. The Corps' Forest Management Plan facilitates the maintenance of suitable habitats for the area's wildlife species. This is accomplished through selective tree thinning, the creation of wildlife openings and food plots, and the placement of nesting boxes. The Corps has allocated 26 percent of Hartwell Lake's shoreline as protected lakeshore area. The remaining property is classified as prohibited access, public recreation, or limited development lands.

Hart State Park, located three miles north of Hartwell, off U.S. 29, offers a variety of facilities and activities. The park, located at the edge of Lake Hartwell, has camping sites, cottages, picnic sites, and a beach. In addition to a boat ramp and dock, fishing boat rentals are available at the park.

Other state parks near Hartwell include Victoria Bryant State Park, which is located near Royston, and includes 475 acres with 43 campsites, 8 miles of trails, and fishing. Tugaloo State Park is located near Lavonia and offers 393 acres, 112 campsites, swimming, boating, and hiking. Richard B. Russell State Park is on the banks of the 26,000-acre Lake Russell. The park's 2,508 acres provides room for 17 cottages, 28 campsites, swimming, rowing, 6 miles of hiking and bicycling trails, and the 18 hole Arrowhead Pointe Golf Course.

Wildlife Management Areas (WMA) through out Georgia have been developed to help maintain, enhance, or protect sustainable and diverse wildlife populations and habitats, provide wildlife-dependent recreation on areas with minimal development, and as a venue to educate citizens on the value an need for wildlife and plant communities. The Hart County WMA is located 5.5 miles southwest of the City of Hartwell, and encompasses 1,000 acres. Hart County WMA provides numerous recreation activities including hunting (for deer, dove, turkey, and

other small game), hiking, and picnicking.

Goals, Policies and Objectives

Goal
Protect natural resources identified in Hartwell.
Policy
Take the necessary steps and actions to conserve and preserve sensitive resources for the benefit to the public.
Objective
Undertake a education campaign informing the public of such resources and how they can help protect them as well as help the city save dollars.
Adopt the necessary ordinances that will protect such resources.
Policy
Pursue stormwater management for the prevention of floods and protection of citizens and property.
Objective
Identify problem areas in the city through a stormwater management study.
Address areas through a city-wide stormwater management plan.
Adopt structural and non-structural requirements for stormwater management into development codes.
Incorporate stormwater management improvements into city capital improvements program